AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listing of claims in this application:

LISTING OF CLAIMS

Claims 1-28. Canceled.

Claim 29. (Currently Amended) An isolated DNA molecule comprising a nucleotide sequence encoding an N-methyl transferase of SEQ ID NO:1 and having the N-methyl transferase enzyme activities of 7-methylxanthine N3 methyl transferase, theobromine N1 methyl transferase, and paraxanthine N3 methyl transferase.

Claim 30. (Currently Amended) An isolated DNA molecule comprising a modified nucleotide sequence which is 90% homologous ~~hybridized under stringent conditions~~ to the ~~complementary strand of the~~ nucleotide sequence of Claim 29, where the polypeptide encoded by said modified nucleotide sequence maintains all of said N-methyl transferase enzyme activities ~~and where hybridization of the modified nucleotide sequence to the complementary strand is carried out by the steps of~~

~~i. preparing a blocking reagent by preparing a solution consisting of 100 x Denhard't solution, 2 % (Weight/Volume) bovine serum albumin, 2 % (Weight/Volume) Ficll 400, 2 % (Weight/Volume) polyvinyl pyrrolidone at a 5-fold concentration and diluting the resultant solution to 1/20;~~

~~ii. preparing a hybridization buffer consisting of 0.1 wt. % sodium dodecyl sulfate, 5 wt. % Dextran sulfate, 1/20 volume of the blocking reagent and 2 to 7 x SSC provided that 20 x SSC is a 3M sodium chloride and 0.3M citric acid solution;~~

~~iii. treating a membrane to which the modified nucleotide sequence is transferred with a hybridization buffer including the complementary strand labeled by a label as a probe at a temperature between 40 to 80°C for at least several hours necessary for the hybridization;~~

~~iv. washing the membrane in a washing buffer; and~~

~~v. identifying the probe thus hybridized to the modified nucleotide sequence on the membrane~~.

Claim 31. (Currently amended) ~~An~~ The isolated DNA molecule ~~as claimed in~~ of claim 30, wherein said modified nucleotide sequence encodes the N-methyl transferase of SEQ ID NO:1.

Claim 32. Canceled.

Claim 33. (Currently Amended) The isolated DNA molecule ~~as claimed in~~ of claim 29 ~~or 32~~, wherein said isolated DNA molecule consists of SEQ ID NO:2.

Claim 34. (Currently Amended) An isolated RNA molecule comprising a nucleotide sequence encoding an N-methyl transferase of SEQ ID NO:1 and having the N-methyl transferase enzyme activities of 7-methylxanthine N3 methyl transferase, theobromine N1 methyl transferase, and paraxanthine N3 methyl transferase.

Claim 35. (Currently Amended) An isolated RNA molecule comprising a modified nucleotide sequence which is 90% homologous ~~hybridizes under stringent conditions to the complementary strand~~ to the nucleotide sequence of Claim 34, where the polypeptide encoded by said modified nucleotide sequence maintains all of said N-methyl transferase enzyme activities ~~and where hybridization of the modified nucleotide sequence to the complementary strand is carried out by the steps of~~

~~i. preparing a blocking reagent by preparing a solution consisting of 100 x Denhard't solution, 2 % (Weight/Volume) bovine serum albumin, 2 % (Weight/Volume) Ficll 400, 2 % (Weight/Volume) polyvinyl pyrrolidone at a 5-fold concentration and diluting the resultant solution to 1/20;~~

~~ii. preparing a hybridization buffer consisting of 0.1 wt. % sodium dodecyl sulfate, 5 wt. % Dextran sulfate, 1/20 volume of the blocking reagent and 2 to 7 x SSC provided that 20 x SSC is a 3M sodium chloride and 0.3M citric acid solution;~~

~~iii. treating a membrane to which the modified nucleotide sequence is transferred with a hybridization buffer including the complementary strand labeled by a label as a probe at a temperature~~

~~between 40 to 80°C for at least several hours necessary for the hybridization;~~

~~iv. washing the membrane in a washing buffer; and~~

~~v. identifying the probe thus hybridized to the modified nucleotide sequence on the membrane~~.

Claim 36. (Currently Amended) ~~An~~ The isolated RNA molecule of claim 35, wherein said modified nucleotide sequence encodes the polypeptide of SEQ ID NO:1.

Claim 37. Canceled.

Claim 38. (Currently Amended) The isolated RNA molecule ~~as claimed in~~ of claim 34 ~~or 37~~, wherein said isolated RNA molecule consists of SEQ ID NO:3.

Claim 39. (Currently Amended) An expression vector comprising the DNA molecule ~~as claimed in~~ of claim 29[[,]] and a plant promoter, wherein ~~the~~ said vector expresses ~~the~~ N-methyl transferase in plant cells.

Claim 40. (Currently Amended) An expression vector comprising the DNA molecule ~~as claimed in~~ of claim 30[[,]] and a plant promoter for expressing an N-methyl transferase encoded by the DNA molecule in plant cells.

Claim 41. (Currently Amended) A vector comprising ~~a~~ the DNA molecule ~~as claimed in~~ of claim 29.

Claim 42. (Currently Amended) A vector comprising ~~a~~ the DNA molecule ~~as claimed in~~ of claim 30.

Claim 43. (Currently Amended) The vector ~~as claimed in~~ of claim 41, wherein ~~the~~ said vector expresses an N-methyl transferase with 7-methyl xanthine N3 methyl transferase, theobromine N1 methyl transferase, and paraxanthine N3 methyl transferase activities in cells of at least one ~~of microorganisms or plants~~ microorganism or plant.

Claim 44 (Currently Amended) The vector ~~as claimed in~~ of claim 42, wherein ~~the~~ said vector expresses an N-methyl transferase with 7-methyl xanthine N3 methyl transferase, theobromine N1 methyl transferase, and paraxanthine N3 methyl transferase activities in cells of at least one ~~of microorganisms or plants~~ microorganism or plant.

Claim 45 (Currently Amended) A plant cell, plant tissue, or whole plant, wherein ~~the~~ said plant cell, plant tissue, or whole plant is transformed with the vector ~~as claimed in~~ of claim 41 or 43.

Claim 46. (Currently Amended) A plant cell, plant tissue, or whole plant, wherein ~~the~~ said plant cell, plant tissue, or whole plant is transformed with the vector ~~as claimed in~~ of claim 42 or 44.

Claim 47. (Currently Amended) The plant cell, plant tissue, or whole plant ~~as claimed in~~ of claim 45, wherein ~~the~~ said vector is introduced by infection.

Claim 48. (Currently Amended) The plant cell, plant tissue, or whole plant ~~as claimed in~~ of claim 46, wherein ~~the~~ said vector is introduced by infection.

Claim 49. (Currently Amended) A method for producing a plant secondary metabolite selected from the group consisting of 7-methyl xanthine, paraxanthine, theobromine, and caffeine wherein ~~the~~ said method comprises

culturing the transformed plant cell, plant tissue, or whole plant ~~as claimed in~~ of claim 45 to form a plant body, and

culturing said plant body to produce a plant secondary metabolite, wherein said plant cell, plant tissue, or whole plant is a Camellia or a Coffea plant cell, plant tissue, or whole plant.

Claim 50. (Currently Amended) A method for modifying the concentration of caffeine in a cell wherein ~~the~~ said method comprises:

culturing ~~the~~ said plant cell or plant tissue ~~as claimed in~~ of claim 45 to form a plant body, and

culturing said plant body to modify the concentration of caffeine, wherein said plant cell or plant tissue is a Camellia or a Coffea plant cell or plant tissue.

Claim 51. (Currently amended) The method ~~as claimed in~~ of claim 49, wherein said transformed whole plant ~~are~~ is a cultured Camellia plant or a cultured Coffea plant.

Claim 52. (Currently Amended) A vector encoding the RNA molecule ~~as claimed in~~ of claim 34.

Claim 53. (Currently Amended) A vector encoding the RNA molecule ~~as claimed in~~ of claim 35.

Claim 54. (New) The isolated DNA molecule of Claim 30, wherein said modified nucleotide sequence is 95% homologous to the nucleotide sequence of Claim 29.

Claim 55. (New) The isolated RNA molecule of Claim 35, wherein said modified nucleotide sequence is 95% homologous to the nucleotide sequence of Claim 34.